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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,359	10/23/2001	William P. Delaney	01-021	2012
24319	7590	03/07/2005	EXAMINER	
LSI LOGIC CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			TRAN, DENISE	
			ART UNIT	PAPER NUMBER
			2186	

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,359

Applicant(s)

DELANEY, WILLIAM P.

Examiner

Denise Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2002.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
4a) Of the above claim(s) 13-20, 33 and 34 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1--12 and 21-32 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-12 and 21-32, drawn to a system comprising: a communication channel linking a primary controller to a secondary controller and a secondary storage volume capable of storing data mirroring the primary storage volume, classified in class 710, subclass 100; 711/162.
 - II. Claims 13-20 and 33-34, drawn to a method comprising: comparing a cyclic redundancy check scan of a second storage volume to the cyclic redundancy check scan of the second storage volume and writing a primary storage volume block into the non matching block of the secondary storage volume, classified in class 714, subclass 758.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in a system which lacked comparing a cyclic redundancy check scan of a second storage volume to the cyclic redundancy check scan of the second storage volume and writing a primary storage volume block into the non matching block of the secondary storage volume. See MPEP § 806.05(d).

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3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Peter Scott (Reg. No. 33,279) on 2/28/05 a provisional election was made without traverse to prosecute the invention of group I, claims 1-12 and 21-32. Affirmation of this election must be made by applicant in replying to this Office action. Claims 13-20 and 33-34 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Claims 1-12 and 21-32 are presented for examination.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1 and 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanai et al., U.S. Patent No. 5,742,792.

As per claim 1, Yanai teaches the use of a mirrored storage volume system, capable of incoherency correction, comprising

a primary storage controller capable of managing data, wherein the primary storage controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 16 and col. 40, lines 17-31);

a primary storage volume suitable for storing data, wherein the primary storage volume is linked to the primary controller (e.g. figure 1, element 20);

a secondary storage controller capable of accepting transferred data from the primary storage controller, wherein the secondary controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 44 and col. 40, lines 17-31);

a secondary storage volume linked to the secondary storage controller wherein the secondary storage volume is capable of storing data mirroring the primary storage volume (e.g. figure 1, element 48 and col. 2, lines 29-38); and

a communication channel linking the primary controller to the secondary controller wherein the communication channel is suitable for communicating data transfers (e.g. figure 1, element 40).

As per claim 8, Yanai teaches the use of the primary storage controller is capable of directing the primary storage volume to read and write data (e.g. col. 3, lines 50-52).

As per claim 9, Yanai teaches the use of the second storage volume is geographically remote from the primary storage volume (e.g. col. 2, lines 29-38).

As per claims 10-12, Yanai teaches the use of a volatile memory linked to the primary storage controller, wherein the volatile memory is suitable for maintaining a coarse grain bit map which maintains the bit map if the communication channel is interrupted and contains data representing changes to the primary storage volume (e.g. col. 29, lines 35-55 and col. 36, lines 10-25).

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Bauer et al., U.S. Patent No. 5,870,759, hereinafter Bauer.

As per claims 2-5, Yanai does not specifically show the use of either the primary storage controller or the secondary storage controller initiating the CRC check of their own storage after an interruption in the communication channel and comparing the CRC scans from each volume and requesting non-matching data blocks. Bauer shows the use of either the primary storage controller or the secondary storage controller initiating the CRC (i.e., checksum) check of their own storage after an interruption in the

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communication channel and comparing the CRC (i.e., checksum) scans from each volume (e.g. abstract and figures 5-6) and requesting non-matching data blocks (e.g. figures 5-6). It would have been obvious to one of ordinary skill in the art to combine Bauer with Yanai because it would provide for proper data consistency.

11. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of "Official Notice".

As per claims 6 and 7, Yanai does not specifically show the use of CFC scans at a set time period or the scan being low priority. "Official Notice" is taken that both the concept and advantages of providing for CFC scans at a set time period or the scan being low priority is well known and expected in the art. It would have been obvious to one of ordinary skill in the art to include CFC scans at a set time period or the scan being low priority to Yanai because it would provide for continuous data consistency and prevent the interruption of higher priority tasks, such as performing the mirroring itself.

12. Claims 21 and 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Howard et al., U.S. Patent No. 6,629,198, hereinafter Howard.

As per claim 21, Yanai teaches the use of a mirrored storage volume system, capable of incoherency correction, comprising

a primary storage controller capable of managing data, wherein the primary

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storage controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 16 and col. 40, lines 17-31);

a primary storage volume suitable for storing data, wherein the primary storage volume is linked to the primary controller (e.g. figure 1, element 20);

a secondary storage controller capable of accepting transferred data from the primary storage controller, wherein the secondary controller is capable of cyclic redundancy checking stored data (e.g. figure 1, element 44 and col. 40, lines 17-31);

a secondary storage volume linked to the secondary storage controller wherein the secondary storage volume is capable of storing data mirroring the primary storage volume (e.g. figure 1, element 48 and col. 2, lines 29-38); and

a communication channel linking the primary controller to the secondary controller wherein the communication channel is suitable for communicating data transfers (e.g. figure 1, element 40).

Yanai does not specifically show the use of the controllers performing at least one of a MD-5 and a SHA-1 scan. Howard shows the use of performing at least one of a MD-5 and a SHA-1 scan (e.g., col. 3, lines 47-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Howard with Yanai because it would provide for a more robust hashing function, as taught by Howard.

As per claim 28, Yanai teaches the use of the primary storage controller is capable of directing the primary storage volume to read and write data (e.g. col. 3, lines 50-52).

As per claim 29, Yanai teaches the use of the second storage volume is geographically remote from the primary storage volume (e.g. col. 2, lines 29-38).

As per claims 30-32, Yanai teaches the use of a volatile memory linked to the primary storage controller, wherein the volatile memory is suitable for maintaining a coarse grain bit map which maintains the bit map if the communication channel is interrupted and contains data representing changes to the primary storage volume (e.g. col. 29, lines 35-55 and col. 36, lines 10-25).

13. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Howard et al., U.S. Patent No. 6,629,198, hereinafter Howard and in further view of Bauer et al., U.S. Patent No. 5,870,759, hereinafter Bauer.

As per claims 22-25, Yanai does not specifically show the use of either the primary storage controller or the secondary storage controller initiating the correction check of their own storage after an interruption in the communication channel and comparing the correction scans from each volume and requesting non-matching data blocks. Bauer shows the use of either the primary storage controller or the secondary storage controller initiating the correction (i.e., checksum) check of their own storage after an interruption in the communication channel and comparing the correction (i.e.,

checksum) scans from each volume (e.g. abstract and figures 5-6) and requesting non-matching data blocks (e.g. figures 5-6). It would have been obvious to one of ordinary skill in the art to combine Bauer with Yanai because it would provide for proper data consistency.

14. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al., U.S. Patent No. 5,742,792. in view of Howard et al., U.S. Patent No. 6,629,198, hereinafter Howard and in further view of "Official Notice".

As per claims 26 and 27, Yanai does not specifically show the use of scans at a set time period or the scan being low priority. "Official Notice" is taken that both the concept and advantages of providing for scans at a set time period or the scan being low priority is well known and expected in the art. It would have been obvious to one of ordinary skill in the art to include scans at a set time period or the scan being low priority to Yanai because it would provide for continuous data consistency and prevent the interruption of higher priority tasks, such as performing the mirroring itself.

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a) Kilner (5649089) shows mirroring system with CRC;
- b) Kedem (6725331) shows mirroring system with CRC;
- c) DeKoning et al. (6480970) shows mirroring system with CRC; and

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d) EMC, "EMC Best Practices: Symmetrix Connect and File Level Granularity," February 2001, pages 1-28.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise Tran whose telephone number is (571) 272-4189. The examiner can normally be reached on Monday, Thursday, and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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